

## STATISTICAL TREATMENT OF NUCLEAR LEVEL SCHEMES AND SPIN CUT-OFF PARAMETER

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Recently, extensive level schemes have been established \* which are complete in a given energy and spin range and which contain reliable spin and parity assignments. This level scheme together with neutron resonance data represents an ideal prerequisite in order to test statistical theories and to determine statistical parameters below the neutron binding energy.

In the present work the energies, spins and parities of hundreds of level schemes are applied to determine the spin cut-off factor for low lying levels as a function of atomic mass number,  $A$ . A balance number of even-even, even-odd and odd-odd, light, medium heavy and heavy, spherical and deformed nuclei are considered in this investigation. We have found that unlike the claims made by some authors, the spin cut-off factor does not follow a smooth  $A$  dependence and also deviates substantially from their corresponding rigid body values. We reported already some preliminary results at the recent APS meeting (DNP) October, 2003.

Level density parameter has also been obtained using this data and its dependence on  $A$ , on pairing energies and shell effects are determined. We have shown that the level density parameter near the major shells is very different than their corresponding experimental values. This can be accounted for by considering pairing interactions and shell effects as well. We have initiated such an investigation, the results will be presented and discussed.

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